

What is claimed is:

1. A costimulating molecule
 - a) having the biological activity of costimulation of T cells,
 - b) which occurs on activated CD4⁺ and CD8⁺ T lymphocytes but not resting or
5 activated B cells, granulocytes, monocytes, NK cells or dendritic cells, and
 - c) which has two polypeptide chains, the said molecule having a molecular weight of about 55 to 60 kDa determined in a nonreducing SDS polyacrylamide gel electrophoresis, and the two polypeptide chains of the said molecule having a molecular weight of about 27 kDa and about 29 kDa measured in a reducing SDS polyacrylamide gel electrophoresis.
- 10 2. A costimulating molecule having the biological activity of costimulation of T cells comprising an amino-acid sequence which shows at least 40% homology with the sequence comprising 199 amino acids in Fig. 15 (SEQ ID NO:2), or a biologically active fragment or an analogue thereof.
- 15 3. A costimulating molecule having the biological activity of costimulation of T cells according to Claim 2 and comprising the amino acid sequence shown in Fig. 15 (SEQ ID NO:2), or a biologically active fragment or an analogue thereof.
- 20 4. A DNA sequence which encodes a costimulating molecule according to Claim 1 or a fragment thereof.
5. A DNA sequence which encodes a costimulating molecule according to Claim 2 or a fragment thereof.
- 25 6. A DNA sequence encoding a costimulating molecule having the biological activity of costimulation of T cells, the sequence being selected from the group consisting of:
 - a) the DNA sequence shown in SEQ ID NO:1 (Fig. 16) and its complementary strand
 - b) DNA sequence hybridizing with the sequences in (a) and
 - c) DNA sequences which, because of the degeneracy of the genetic code,
30 hybridize with the sequences in (a) and (b).
7. A plasmid or a viral DNA vector comprising a DNA sequence according to Claim 4.
8. A plasmid or a viral DNA vector comprising a DNA sequence according to Claim 5.
- 35 9. A prokaryotic or eukaryotic host cell stably transformed or transfected with a plasmid or DNA vector according to Claim 4.

10. A prokaryotic or eukaryotic host cell stably transformed or transfected with a plasmid or DNA vector according to Claim 5.

5 11. Method for preparing a costimulating molecule according to Claim 1, comprising the cultivation of the host cell according to Claim 9 for expression of the said molecule in the host cell.

12. Method for preparing a costimulating molecule according to Claim 1, comprising the cultivation of the host cell according to Claim 10 for expression of the said molecule in the host cell.

10 13. Method for preparing a costimulating molecule according to Claim 2, comprising the cultivation of the host cell according to Claim 9 for expression of the said molecule in the host cell.

14. Method for preparing a costimulating molecule according to Claim 2, comprising the cultivation of the host cell according to Claim 10 for expression of the said molecule in the host cell.

15 15. An antibody which binds a costimulating molecule according to Claim 1.

16. An antibody which binds a costimulating molecule according to Claim 2.

17. An antibody according to Claim 15, which is a monoclonal antibody.

20 18. An antibody according to Claim 16, which is a monoclonal antibody.

19. A monoclonal antibody which specifically recognizes a costimulating molecule according to Claim 1, characterized in that B cells of mice which are immunized with human T lymphocytes activated PMA and the Ca^{2+} ionophore ionomycin are fused with a myeloma cell line to
25 give an antibody-secreting hybridoma, and the monoclonal antibodies are purified in flow cytometry for 2-signal molecule-activated against resting T cells.

20. A monoclonal antibody which specifically recognizes a costimulating molecule according to Claim 2, characterized in that B cells of mice which are immunized with human T lymphocytes activated PMA and the Ca ionophore ionomycin are fused with a myeloma cell line to
30 give an antibody-secreting hybridoma, and the monoclonal antibodies are purified in flow cytometry for 2-signal molecule-activated against resting T cells.

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